--In the last issue an item regarding the status of Zebra Systems Inc was in error and I regret any inconvience it may have caused. ZEBRA is still in business and is still continuing to support the TS1000 and TS2068 lines. For their latest price list contact them at 78-06 Jamaica Avenue, Woodhaven, NY 11421- (718) 296-2385. Paul Hill, Editor

-----------------Secretary's Notes---------------

Our March meet was highlighted by the talk by our Tresurer George Penny, on the subject- "Programming in English". George a retired IBM programmer, owns a business in Owego, NY and uses his ZX81s and TS1000s to keep track of stock inventories, prices, profits and costs and as a cash register. In Basic he wrote a program to service his data files. The flexibility of his system (on tape) allows him to write quick simple in plain english instructions how he wants his data files printed, compared, sorted, and tallied. I am after him to write an article on his pursuit, and soon we maybe able to read of his system. Currently he is teaching himself MC, and his is rewriting the program in code. After that is done, an article will be on its way.

Clyde Tackley demoed his RGB interface, and his son demoed his dexterity on the keyboard (Clyde said that his son can go faster on the keys than with a joystick!)

Wes Brzozowski mentioned PC Pursuit- unlimited phone calls for $25 a month, from 6pm to 7 am.

Alrin Menager, SYSOPS of BUBBS, came to the April meet to give a few tips on using his board. BUBBS stands for Belden Hill Users Bulletin Board System- His tips for time saving-

..when asked for first name, type first name (space or ;)last name (space or ;) password <ENTER>.

..To read all public messages, type r (space or ;) * <ENTER> .

..To find new files, type n (space or ;) a <ENTER>.

..Enter dates with no (spaces or ;), type 040187 to locate files since that date.

..Macro keys can be used for entering name, password, messages.

LOCAL BBSs	numbers	baud rates	hours/days
BUBBS	(607)693-3359	3/1200 baud	5pm to 9am Mon - Fri; 24 hours on
		1200 only	9am to 5pm Mon - Fri; weekends
TCCS	(607)785-2118	3/1200 baud	9am to 11pm 7 days a week

   * Scott Wiltsey (TCCS SYSOPS) is putting a conference on for SINCUS members.

OFA-PC Node 1	(607)754-4320	3/12/2400	24 hours DAILY
OFA-PC Node 2	(607)687-4346	3/1200	24 hours DAILY

   * Matt Lecher is the SYSOPS of OFA-PC

Hello and welcome to Brian King, Ballston Spa, NY; Al Johnson, Seaside, CA; and Ronald Ranc, Germany and a thank you for continued support to Peter Hoffmann, Greenwich RI; Myles Cohen, New York, NY and Robert Gilder, Massapequa, NY

MAY meet- Wednesday, MAY 20TH, 7pm-
   Vestal Library, Vestal Parkway,
Vestal NY. ELECTION NIGHT come on down
         and VOTE!!
JUNE meet- Wednesday, JUNE 20TH, 7pm-
   Vestal Library, Vestal Parkway,
        Vestal NY.

Nominations for officers for the year 1987-88 were opened and the following names were nominated:

President--------John Sims   Vice Pres.-------David Schoenwetter
Treasurer--------George Penny   Secretary-------Paul Hill
Trustees---------Don Lamen, Wes Brzozowksi, William Tilley

Nominations will be closed prior to the vote, nominations and ballots received by mail prior to floor vote on May 20, 1987, will be counted.

NEW, NEWS, VIEWS and REVIEWS.....................by Paul Hill

NEW: PANDORA the "Z88" (no X?)a laptop portable computer by Sir Clive Sinclair was released this past Feb. 17. With a Z80 CPU, (also a 8088 has been reported) and 32K RAM, it is reported to be able to transfer files with an IBM PC. Battery powered, and memory cartridges, with a flat screen it doesnt seem to be stirring much interest around here anyway. About $300 (US) for the latest, due in the US, between now and sometime in the next few years....for a peek at one get Mar/Apr 87 issue of Time Design Mag, $3 for back issues, $15 a year, write to Tim Woods, TDM, 29722 Hult Rd., Colton, OR 97017

NEW: PC8300 a TS1000 CLONE?? see article(page 5 - 7)by Donald Lambert, Cedar Radids, IA. It is a Chinese made clone and has a few improvements which make it sound interesting. If interested write American Design Components, 62 Joseph St., Moonachie, NJ, 07074 tele:(800)524-0809 price $29.95 + $5.99 shipping

----

NEW: Improvements by John Oliger to his disc system. Now support CAT. Clyde Tackley just got his disc IF from Oliger and Clyde is impressed by the speed of delivery and workmanship. We look forward to further reports on this Clyde!!

NEW: 256K RAM disc available SOON-write Larken Electronics at RR#2, Navan Ontario, Canada K4B 1H9 also NEW updates to his disc systems for the 81 and the 2068!

NEW: 2068 version of Specterm available- see article by John Colonna/Pete Fischer page 19-20

NEW: External keyboard for the 2068 plugs into cartridge port-interface only $39.95, I/F and keyboard only $69.95; write for info John Mathewson, 1852 Appleford St., Gloucester, Ontario, Canada K1J 6T4

NEWS: Recently I mentioned SYNAPSE was having problems, and I also kept getting our swap back, well thanks to TIMELINEZ, the correct address is now in my files. Hopefully we can continue swapping with SYNAPSE, Robert Heil, Editor, 642 North Street, McSherrytown, PA 17344

NEWS: The Sinclair Computer Fest- 1987 will probably be history by the time this gets read. It just was not in the cards again for anyone locally to attend. Eternal hope for next time. We here wish the best of luck and fun times to all who attend.

Thanks to this months contributors-Wes Brzozowski, Scott Eddy, Dave Schoenwetter, John Colonna, Pete Fischer and Donald Lambert. Wes's proportional printing on the 2068 is awaiting documentation, hope to see it next time.

RLE- Run Length Encoded- get your copy of this encoding/decoding program and start taking part in the transmission of graphics on your computer. BUBBS (see front page) has RLE program and several files to download-thanks to J. Colonna.
I believe this version on BUBBS is the masterpiece of Jack Dohany!!

2

RS232 PORT ADDED TO TIMEX 2050 MODEM CARD
Construction

To add the RS232 Port to the 2050 Modem Card requires the addition of two IC's, a four pole double throw switch and a 9 volt battery. Component mounting is not critical and I found that all parts can be mounted on a small PC board and piggy-backed on the top of the modem card. Select an area of the card where there are no modem components and drill two small holes using care not to cut any circuit traces on the board. A large enough area exists next to the 8251 (U2), this is where I mounted the piggy-back board. Next, using an Exacto-Knife, cut the copper circuits at the 8251 (U2) at pin 3 (RXD), pin 17 (CTS) and pin 22 (DSR). These are the three input lines to the 8251. Using a very fine point soldering iron, solder wires directly to the pins on the 8251 where the cuts were made. The other end of the wires are connected to the operating points of the four pole double throw switch as indicated in the wiring diagram. One side of the switch is then wired to the pins 1,4 and 11 on U8 and the other side is connected to the MC1489 RS232 line receiver. Next solder wires in the same manner to pins 19, 23 and 24 of the 8251 (U2). Connect the other end of the wires to the MC1488 RS232 line driver as shown in the diagram. The 8251 output signals are not switched and go the RS232 driver and modem. Add wires to the voltage points, I picked up the +5 volts at jumper W2 and +9 volts at the + side of C19. The ground connection can come from any of the large plated areas on the board. Finally, add the RS232 cable or connector. I used a 25 pin D-connector and the standard RS232 configuration. This will allow connection to a wide variety of devices such as external modems or serial interfaces on printers. Carefully check all connections for solder bridges or wire shorts.

Circuit Description

The MC1488 Driver and MC1489 Receiver provide a conversion from RS232 voltage levels (+15 to -15) to TTL levels (0 to +5). THree input and three output lines are connected to the 8251, four are control signals and two are data. To provide the minus RS232 level, a 9 volt battery is used. This will eliminate the necessity of an added power supply. The MC1489 line receiver requires a +5 volt source. This is connected to the modem card but the +5 volts is supplied by the Timex/Sinclair 2068 or T/S1000.

Checkout

The RS232 Port can be tested using a cable wrap method. At the RS232 connector, jumper RXD to TXD ,RTS to CTS and DTR to DSR. Load and run Mterm Smart II. Do a manual connect operation. The CONNECT prompt should appear. Then type characters in the FULL DUPLEX mode and the characters should echo to the screen as in half duplex mode only now the data is actually being transmitted and then received by the 8251. If all of these indications are observed then you are ready to connect to an RS232 device.
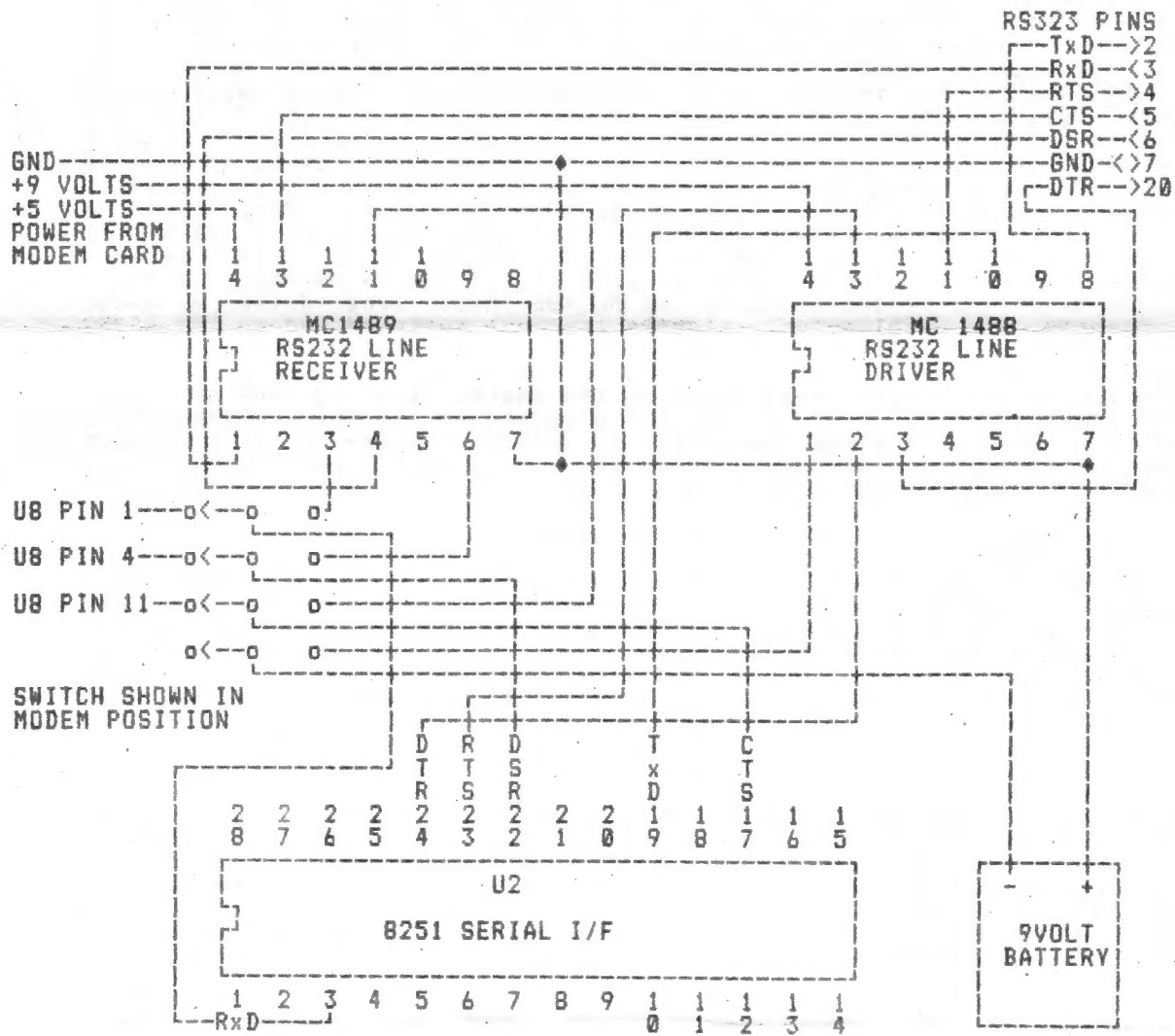
Operation

When using the RS232 Port, some of the modem circuits are left connected, therefore it is recommended that the phone cord be disconnected from the modem to prevent disruption of phone service. The 8251 must be initialized with software. When Mterm Smart II is started, the mode and control characters are sent to the 8251. The software then checks the conditions of the 8251 to see if the proper handshaking signals are present. The CTS line must be active for the for the 8251 to transmit data. This is an internal operation of the 8251 and cannot be bypassed. If your RS232 device is not capable of activating the CTS signal then jumper the RTS to CTS at the RS232 connector. The software will also check the state of the DSR line, if your serial device does not support this line then jumper DTR to DSR. Both software and device must be set at the same baud rate and communication parameters, such as 8 data bits, 1 stop bit and no parity.

Computer to computer communications

To use the RS232 to communicate directly with another computer bypassing modems, the RXD and TXD lines must be swapped at one end of the cable. This will make the TXD at computer A become the RXD at computer B and the RXD at computer A become TXD at computer B. Both computers must be set at the same baud rate and communication parameters.

```
                                                         RS323 PINS
                                                      ┌─TxD──>2
                                                    ┌─┼─RxD──<3
                                                  ┌─┼─┼─RTS──>4
                                                ┌─┼─┼─┼─CTS──<5
                                              ┌─┼─┼─┼─┼─DSR──<6
GND───────────────────────────────┬──────────┼─┼─┼─┼─┼─GND──<>7
+9 VOLTS───────────────────────────           ┌─DTR──>20
+5 VOLTS───────
POWER FROM        1 1 1 1 1              1 1 1 1 1
MODEM CARD        4 3 2 1 0 9 8          4 3 2 1 0 9 8

                    MC1489                    MC 1488
                    RS232 LINE                RS232 LINE
                    RECEIVER                  DRIVER

                  1 2 3 4 5 6 7          1 2 3 4 5 6 7

U8 PIN 1 ───o<──o    o
U8 PIN 4 ───o<──o    o
U8 PIN 11───o<──o    o
            o<──o    o

SWITCH SHOWN IN
MODEM POSITION
                      D R D        T     C
                      T T S        x     T
                      R S R        D     S
                  2 2 2 2 2 2 2 2 2 1 1 1 1 1
                  8 7 6 5 4 3 2 1 0 9 8 7 6 5

                            U2                          -   +

                        8251 SERIAL I/F                9VOLT
                                                       BATTERY
                  1 2 3 4 5 6 7 8 9 1 1 1 1 1
                  └RxD─                0 1 2 3 4
```

```
NOTES ON OPERATION

WHEN NOT IN USE, S1 SHOULD BE SET TO MODEM TO PREVENT BATTERY DRAIN.

DICNONNECT PHONE LINE WHEN USING RS232 PORT.

DISCONNECT RS232 CABLE WHEN USING MODEM.
```

Dave Schoenwetter
SINCUS

ZX81-T/S1000-T/S1500 CLONE: THE PC8300

The ad stated: Advanced version of the T/S1000. Will run all prerecorded tapes for Sinclair/Timex 1000-ZX81. I ordered Feb 22 sent a money order for $35.95 to American Design Components, 62 Joseph Street, Moonachie, N. J. 07074. And received the PC8300 on Mar 06. Today I sent in a money order for $46.95 for another PC8300 plus a 16K Rampak.

Perhaps I'd best start with the physical dimensions of the PC8300. The box and the computer both are missing any markings to identify either the computer or the manufacturer. There is molded into the plastic case made "in Hong Kong". I suspect that it was to be sold and the seller would put on his trade mark and or model number. The computer case (cabinent) is dark ivory or beige and is made of plastic but it does not have any shielding whatsoever. The case dissembles by removing 3 screws and then prying the case apart. There are snap catches molded into the plastic that hold it together. When you lift the top and the keyboard you will find the cable (16 wire ribbon cable) that connects the computer and the keyboard and if you are carefull you can tilt the keyboard back and take out four screws to remove the computer board itself. The case is 11 5/8 inches long by 6 inches wide and 2 1/4 inches high.

The computer board is 10 1/2 inches long and 3 9/16 inches deep with a 7805 regulator heatsink (black) that sticks up 1 inch and is 3 7/8 inches long. The external bus connector is centered on the length of the computer board. The board has 4 spaces for sockets to be installed if you want to clean out the solder from the holes for 4 2114 RAMS. All of the chips except the RAM are mounted parallel to the length of the computer board. There was no attempt to crowd the circuitry to compact the board.

The keyboard has 42 keys including 2 SHIFT keys and a RESET and has a LED power on indicator. The keys have action similar to the T/S1500 but the keys are slightly larger. The RESET key is to the right of the 0 key and there is a shift key on either end of the bottom row with the SPACE key between the period key and the SHIFT key. You have to spell out almost all commands since there are only a few like SIN, LINE NO., and DELETE are given. The keyboard is mounted to the computer top cover with molded in snaplock fasteners so you can get the computer out for repair.

With the computer in working position all the ports are on the back side from left to right they are TV, JOYSTICK (9 pin socket) EXTERNAL BUS, MONITOR, MIC, EAR, and DC POWER. The DC Power plug is the kind that has a hole in the center and the power plug for T/S 2068 will fit A B S O L U T E L Y   D O N O T T R Y I T! The reverse polarity will fry the 7805 regulator at the very least and damage other things too. More about that later. Like on the T/S1500 the closeness of the other ports will hinder the use of certain peripherals.

The computer has the following chips: Z80 CPU, c4005 (their

version of a ULA), AMI 8444 AB ROM, TMM 2016 RAM, SN74LS05N, and of course the 7805 regulator. Only the 7805 and the 74LS05 are soldered in the others are all socketed. And while it isn't a chip the board has a speaker mounted on the near right hand end.

The external bus is given in the manual and in English and all the bus call outs are the same as for the ZX81, T/S1000 which I checked against one of my books.

I would have liked to give you a detailed tour of the keyboard but I pulled a bonehead. The power pack that came with my compouter was to be used on 220 VAC so I was thinking and noticed that the power plug on my T/S2068 would fit. So I checked the polarity but I missread or crossed the VOM probes any way when I powered up nothing on the TV and I heard a faint buzzing and I turned off and shortly I smelled the scorched electronic parts. From that point on I have been slowly trying to get it up and running. The Z80 is ok it works on one of my T/S1000 and ditto for the RAM. I had no way for sure to check the ROM or the ULA so at that time I didn't.

I got the computer and keyboard out of the case and got the regulator out, cut leads and got the holes cleared of solder and got another regulator soldered in place and I rigged up a transformer with two 110 VAC primary windings and wired them up serries adding and soldered that to the prongs of the 220 VAC power supply. I fired up the computer board with the chips out of their sockets and no smoke and LED lit up. Fine so I unplugged and plugged in the chips and with the computer board and keyboard loose on a wood surface I fired up again. Still no TV action but a transistor on the computer board cracked open and smoked. Now I need to find a MH9013 transistor or its equivalent. Either the reversed polarity caused the transistor to fail and to go when I powered up or else the the circuity on the bottom of the keyboard touched something on the compoter board and shorted out.

Now I am trying to find a replacement transistor and what I may have to do is to remove as carefully as I can the other MH9013 transistor and use a transistor checker to find out what it is NPN or PNP and maybe the gain and whatever else I need to know to find a replacement. A friend has told me that a 2N2222 or its compliment will very likely work. But before I try to remove the transistor I will see if it can be checked in circuit.

The PC8300 looks like an attempt to duplicate the T/S1000 with a similar but different enough to avoid lawsuits. The more I looked at the computer board the more I thought that the board was enough like the T/S1000 for the ROM and the ULA chips to work. I tried that and I may have blew the chips but I feel the pinouts are very likesly the same. So I have ordered another PC8300 but I will be very carefull next time.

6

```
                 ;Jump here to handle the edit line
                 ; Identical to Spectrum at 0D02

        083D FE02          CP   #02
        083F 3880          JR   C,L07C1    ;Error if lower screen is too large

        0841 FD8631         ADD  A,(IY+49)  ;DF_SZ
        0844 D619           SUB  #19
        0846 D0             RET  NC         ;If we don't have to scroll

        0847 ED44           NEG             ;Number of lines to scroll
        0849 C5             PUSH BC
        084A 47             LD   B,A
        084B 2A8F5C         LD   HL,(ATTR_T)
        084E E5             PUSH HL
        084F 2A915C         LD   HL,(P_FLAG)
        0852 E5             PUSH HL
        0853 CD8808         CALL #0888      ;Use permanent color info
        0856 78             LD   A,B         ;A=the number of lines to scroll
                 ;Scroll the screen A times

        0857 F5      L0857 PUSH AF
        0858 216B5C         LD   HL,DF_SZ
        085B 46             LD   B,(HL)
        085C 78             LD   A,B
        085D 3C             INC  A
        085E 77             LD   (HL),A      ;We just incremented DF_SZ
        085F 21895C         LD   HL,S_POSN + 1
        0862 BE             CP   (HL)
        0863 3803           JR   C,L0868    ;If scrolling lower screen

        0865 34             INC  (HL)
        0866 0618           LD   B,#18       ;Scroll whole screen

        0868 CD3B09  L0868 CALL #093B       ;Does the actual scrolling
        086B F1             POP  AF
        086C 3D             DEC  A
        086D 20E8           JR   NZ,L0857    ;If we're not done

        086F E1             POP  HL
        0870 FD7557         LD   (IY+87),L   ;P_FLAG
        0873 E1             POP  HL
        0874 228F5C         LD   (ATTR_T),HL
        0877 ED4B885C       LD   BC,(S_POSN)
        087B FDCB0286       RES  0,(IY+2)    ;TV_FLAG
        087F CD1409         CALL #0914       ;Move to new print position
        0882 FDCB02C6       SET  0,(IY+2)    ;TV_FLAG
        0886 C1             POP  BC
        0887 C9             RET

                 ;Copy permanent color info into using temporary variables
                 ; Identical to Spectrum at 0D4D

        0888 AF             XOR  A
        0889 2A8D5C         LD   HL,(ATTR_P)
        088C FDCB0246       BIT  0,(IY+2)    ;TV_FLAG
        0890 2804           JR   Z,L0896

        0892 67             LD   H,A
        0893 FD6E0E         LD   L,(IY+14)   ;BORDCR

        0896 228F5C  L0896 LD   (ATTR_T),HL
        0899 21915C         LD   HL,P_FLAG
        089C 2002           JR   NZ,L08A0

        089E 7E             LD   A,(HL)
        089F 0F             RRCA

        08A0 AE      L08A0 XOR  (HL)
        08A1 E655           AND  #55
        08A3 AE             XOR  (HL)
        08A4 77             LD   (HL),A
        08A5 C9             RET

                 ;CLS handler
                 ; Identical to Spectrum at 0D6B

        08A6 CDEA08         CALL #08EA       ;Actually clears display memory
        08A9 213C5C         LD   HL,TV_FLAG
        08AC CBAE           RES  5,(HL)      ;Don't clear lower screen after keypress
        08AE CBC6           SET  0,(HL)      ;Output to lower screen
        08B0 CD8808         CALL #0888       ;We'll use permanent color info
```

```
        08B3 FD4631         LD   B,(IY+49)   ;DF_SZ
        08B6 CD7F09         CALL #097F       ;Clear the bottom B lines
        08B9 21C05A         LD   HL,#5AC0    ;First attribute byte for lower screen
        08BC 3A8D5C         LD   A,(ATTR_P)
        08BF 05             DEC  B
        08C0 1807           JR   L08C9

        08C2 0E20   L08C2 LD   C,#20        ;Characters per line

        08C4 2B      L08C4 DEC  HL           ;Loop to change all attributes in line
        08C5 77             LD   (HL),A
        08C6 0D             DEC  C
        08C7 20FB           JR   NZ,L08C4

        08C9 10F7   L08C9 DJNZ L08C2        ;Loop if more lines

        08CB FD363102       LD   (IY+49),#02 ;DF_SZ - 2 lines in lower screen

                 ;Fix up lower screen
                 ; Identical to Spectrum at 0D94

        08CF 3EFD           LD   A,#FD        ;Channel "K" - internal stream
        08D1 CD3012         CALL #1230       ;Make it current channel
        08D4 2A515C         LD   HL,(CURCHL)
        08D7 110005         LD   DE,#0500    ;Normal output address for screen
        08DA A7             AND  A

        08DB 73      L08DB LD   (HL),E
        08DC 23             INC  HL
        08DD 72             LD   (HL),D       ;Restore output address
        08DE 23             INC  HL
        08DF 110E0C         LD   DE,#0C0E    ;Normal input address
        08E2 3F             CCF
        08E3 38F6           JR   C,L08DB     ;Now loop back & restore input address

        08E5 012117         LD   BC,#1721    ;Point to bottom line
        08E8 182A           JR   L0914       ;Move to that position

                 ;This routine does the actual "display clear"
                 ; Identical to Spectrum at 0DAF

        08EA 210000         LD   HL,#0000
        08ED 227D5C         LD   (COORDS),HL
        08F0 FDCB3086       RES  0,(IY+48)   ;FLAGS2
        08F4 CDCF08         CALL #08CF       ;Cleans up the lower screen
        08F7 3EFE           LD   A,#FE        ;Channel "S" - internal stream
        08F9 CD3012         CALL #1230       ;Make it current channel
        08FC CD8808         CALL #0888       ;Use permanent colors
        08FF 0618           LD   B,#18
        0901 CD7F09         CALL #097F       ;Clear bottom B lines
        0904 2A515C         LD   HL,(CURCHL)
        0907 110005         LD   DE,#0500
        090A 73             LD   (HL),E
        090B 23             INC  HL
        090C 72             LD   (HL),D       ;Current output is standard screen out
        090D FD365201       LD   (IY+82),#01 ;SCR_CT - resets scroll count
        0911 012118         LD   BC,#1821    ;Point to top line

                 ;Find memory address for first byte of a display file character
                 ; Move to this new print position. Enter with BC = row/column
                 ; on display, or C = column in print buffer; FLAGS, bit 1 decides
                 ; Identical to Spectrum at 0DD9

        0914 21005B  L0914 LD   HL,#5B00    ;Print buffer
        0917 FDCB014E         BIT  1,(IY+1)    ;FLAGS
        091B 2012           JR   NZ,L092F    ;If handling printer

        091D 78             LD   A,B
        091E FDCB0246       BIT  0,(IY+2)    ;TV_FLAG
        0922 2805           JR   Z,L0929     ;If handling upper screen

                 ;Must be lower screen
        0924 FD8631         ADD  A,(IY+49)   ;DF_SZ
        0927 D618           SUB  #18

        0929 C5      L0929 PUSH BC
        092A 47             LD   B,A
        092B CDD609         CALL #09D6       ;Compute disp file address of the line
        092E C1             POP  BC
```

7

```
092F  3E21   L092F  LD   A,$21
0931  91            SUB  C
0932  5F            LD   E,A
0933  1600          LD   D,$00        ;DE=Column number
0935  19            ADD  HL,DE        ;Display file address of the character
0936  C3F305        JP   $05F3        ;Move to this position

                    ;Scroll the display 17 (hex) times
                    ; Identical to Spectrum at 0DFE

0939  0617          LD   B,$17

                    ;Scroll the display 8 times
                    ; Identical to Spectrum at 0E00

093B  CDD609        CALL $09D6        ;Get address of line
093E  0E08          LD   C,$08        ;8 Lines per character

0940  C5     L0940  PUSH BC
0941  E5            PUSH HL
0942  78            LD   A,B
0943  E607          AND  $07
0945  78            LD   A,B
0946  200C          JR   NZ,L0954     ;If we're not moving across one of the
                                      ; boundaries for "display thirds"


                    ;Here to handle the "thirds"
0948  EB     L0948  EX   DE,HL
0949  21E0F8        LD   HL,$F8E0
094C  19            ADD  HL,DE
094D  EB            EX   DE,HL
094E  012000        LD   BC,$0020
0951  3D            DEC  A
0952  EDB0          LDIR

                    ;Do the actual scrolling
0954  EB     L0954  EX   DE,HL
0955  21E0FF        LD   HL,$FFE0
0958  19            ADD  HL,DE
0959  EB            EX   DE,HL
095A  47            LD   B,A
095B  E607          AND  $07
095D  0F            RRCA
095E  0F            RRCA
095F  0F            RRCA
0960  4F            LD   C,A
0961  78            LD   A,B
0962  0600          LD   B,$00
0964  EDB0          LDIR
0966  0607          LD   B,$07
0968  09            ADD  HL,BC
0969  E6F8          AND  $F8
096B  20DB          JR   NZ,L0948     ;If there are more "thirds"

096D  E1            POP  HL
096E  24            INC  H
096F  C1            POP  BC
0970  0D            DEC  C
0971  20CD          JR   NZ,L0940     ;If all 8 lines haven't been scrolled

0973  CDC309        CALL $09C3        ;Get the attribute address
0976  21E0FF        LD   HL,$FFE0
0979  19            ADD  HL,DE
097A  EB            EX   DE,HL
097B  EDB0          LDIR              ;Move the attribute bytes
097D  0601          LD   B,$01

                    ;Clear the bottom 8 lines of the display
                    ; Identical to Spectrum at 0E44

097F  C5            PUSH BC
0980  CDD609        CALL $09D6        ;Get address of line
0983  0E08          LD   C,$08

0985  C5     L0985  PUSH BC
0986  E5            PUSH HL
0987  78            LD   A,B


0988  E607   L0988  AND  $07
098A  0F            RRCA
098B  0F            RRCA
098C  0F            RRCA
098D  4F            LD   C,A
098E  78            LD   A,B
098F  0600          LD   B,$00
0991  0D            DEC  C
0992  54            LD   D,H
0993  5D            LD   E,L
0994  3600          LD   (HL),$00
0996  13            INC  DE
0997  EDB0          LDIR
0999  110107        LD   DE,$0701
099C  19            ADD  HL,DE
099D  3D            DEC  A
099E  E6F8          AND  $F8
09A0  47            LD   B,A
09A1  20E5          JR   NZ,L0988

09A3  E1            POP  HL
09A4  24            INC  H
09A5  C1            POP  BC
09A6  0D            DEC  C
09A7  20DC          JR   NZ,L0985

                    ;Here to do attributes
09A9  CDC309        CALL $09C3        ;Get attribute address
09AC  62            LD   H,D
09AD  6B            LD   L,E
09AE  13            INC  DE
09AF  3A8D5C        LD   A,(ATTR_P)
09B2  FDCB0246      BIT  0,(IY+2)     ;TV_FLAG
09B6  2803          JR   Z,L09BB

09B8  3A485C        LD   A,(BORDCR)

09BB  77     L09BB  LD   (HL),A
09BC  0B            DEC  BC
09BD  EDB0          LDIR
09BF  C1            POP  BC
09C0  0E21          LD   C,$21
09C2  C9            RET

                    ;Converts display file address in HL to attribute address
                    ; Also converts line number in B to display position in BC
                    ; Identical to Spectrum at 0E88

09C3  7C            LD   A,H
09C4  0F            RRCA
09C5  0F            RRCA
09C6  0F            RRCA
09C7  3D            DEC  A
09C8  F650          OR   $50
09CA  67            LD   H,A
09CB  EB            EX   DE,HL
09CC  61            LD   H,C
09CD  68            LD   L,B
09CE  29            ADD  HL,HL
09CF  29            ADD  HL,HL
09D0  29            ADD  HL,HL
09D1  29            ADD  HL,HL
09D2  29            ADD  HL,HL
09D3  44            LD   B,H
09D4  4B            LD   C,L
09D5  C9            RET

                    ;Compute display file address of a line.  Enter with line n
                    ; = B.  HL gets the address.
                    ; Identical to Spectrum at 0E9B

09D6  3E18          LD   A,$18
09D8  90            SUB  B
09D9  57            LD   D,A
09DA  0F            RRCA
09DB  0F            RRCA
09DC  0F            RRCA
09DD  E6E0          AND  $E0
09DF  6F            LD   L,A
09E0  7A            LD   A,D
```

```
09E1 E618    AND #18
09E3 F640    OR #40
09E5 A7      LD H,A
09E6 C9      RET
```

```
;###########################################################
;Looks like a debug routine that was never taken out. Waits a
; time delay, then waits for a keypress, then clears the lower
; screen.
; Has no Spectrum counterpart
```

```
09E7 F5      PUSH AF
09E8 C5      PUSH BC
09E9 D5      PUSH DE
09EA 01409C  LD BC,#9C40   ;Time delay
```

```
             ;Wait till timeout
09ED 0B  L09ED DEC BC
09EE 79        LD A,C
09EF B0        OR B
09F0 20FB      JR NZ,L09ED
```

```
             ;Wait for keypress
09F2 AF  L09F2 XOR A
09F3 DBFE      IN A,(#FE)
09F5 E61F      AND #1F
09F7 FE1F      CP #1F
09F9 28F7      JR Z,L09F2
```

```
09FB CDA908    CALL #08A9    ;Part of clear screen routine
09FE D1        POP DE
09FF C1        POP BC
0A00 F1        POP AF
0A01 C9        RET
```

```
;#####################################
;# TS2040 Printer Control Section #
;#####################################
```

```
;COPY handler
; Identical to Spectrum at 0EAC
```

```
0A02 F3      DI
0A03 06B0    LD B,#B0    ;Lines per display
0A05 210040  LD HL,#4000 ;Start of display file
```

```
0A08 E5   L0A08 PUSH HL
0A09 C5         PUSH BC
0A0A CD4A0A      CALL #0A4A  ;Copy 1 line of pixels
0A0D C1         POP BC
0A0E E1         POP HL
0A0F 24         INC H
0A10 7C         LD A,H
0A11 E607       AND #07
0A13 200A       JR NZ,L0A1F
```

```
0A15 7D         LD A,L
0A16 C620       ADD A,#20
0A18 6F         LD L,A
0A19 3F         CCF
0A1A 9F         SBC A,A
0A1B E6F8       AND #F8
0A1D 84         ADD A,H
0A1E A7         LD H,A
0A1F 10E7  L0A1F DJNZ L0A08  ;If all B lines not yet printed
```

```
0A21 180D       JR L0A30    ;To kill the motor & clear the buffer
```

```
;Copy print buffer to TS2040 printer
; Identical to Spectrum at 0ECD
```

```
0A23 F3      DI
0A24 21005B  LD HL,#5B00  ;Address of print buffer
0A27 0608    LD B,#08     ;8 Pixel lines
```

```
0A29 C5   L0A29 PUSH BC
0A2A CD4A0A      CALL #0A4A  ;Copy 1 line of pixels
0A2D C1         POP BC
0A2E 10F9       DJNZ L0A29  ;If all 8 lines not printed
```

```
0A30 3E04  L0A30 LD A,#04
0A32 D3FB        OUT (#FB),A  ;Kill printer motor
0A34 FB          EI
```

```
;Clear printer buffer
; Identical to Spectrum at 0EDF
```

```
0A35 21005B  LD HL,#5B00  ;Address of buffer
0A38 FD7546  LD (IY+70),L ;PR_CC - reset printer position
0A3B AF      XOR A
0A3C 47      LD B,A
```

```
0A3D 77   L0A3D LD (HL),A
0A3E 23         INC HL
0A3F 10FC       DJNZ L0A3D   ;Clear it all
```

```
0A41 FDCB308E  RES 1,(IY+48) ;FLAGS2 - buffer empty
0A45 0E21      LD C,#21      ;Print position
0A47 C31409    JP #0914      ;Store it
```

```
;Copy 1 line of print buffer to TS2040 printer
; Identical to Spectrum at 0EF4
```

```
0A4A 78      LD A,B       ;Line number
0A4B FE03    CP #03
0A4D 9F      SBC A,A      ;00, except for line # = 2 or 1
0A4E E602    AND #02
0A50 D3FB    OUT (#FB),A  ;Slows the motor on the last 2 lines
0A52 57      LD D,A
```

```
0A53 CD0920  L0A53 CALL #2009  ;Check the BREAK key
0A56 380A          JR C,L0A62   ;If it's not pressed
```

```
0A58 3E04    LD A,#04
0A5A D3FB    OUT (#FB),A  ;Kill the motor
0A5C FB      EI
0A5D CD350A  CALL #0A35   ;Clear buffer
```

```
0A60 CF      RST 8
0A61 0C      DEFB #0C     ;BREAK - CONT repeats
```

```
;Here if BREAK was not pressed
0A62 DBFB  L0A62 IN A,(#FB)
0A64 87          ADD A,A
0A65 F8          RET M
0A66 30ED        JR NC,L0A53
```

```
0A68 0E20        LD C,#20
```

```
0A6A 5E   L0A6A LD E,(HL)
0A6B 23         INC HL
0A6C 0608       LD B,#08
```

```
0A6E CB12  L0A6E RL D
0A70 CB13        RL E
0A72 CB1A        RR D
```

```
0A74 DBFB  L0A74 IN A,(#FB)
0A76 1F          RRA
0A77 30FB        JR NC,L0A74  ;Wait till it's ready for next pixel
```

```
0A79 7A          LD A,D
0A7A D3FB        OUT (#FB),A
0A7C 10F0        DJNZ L0A6E
```

```
0A7E 0D          DEC C
0A7F 20E9        JR NZ,L0A6A
```

```
0A81 C9          RET
```

```
;#############################
;# The Line Editor Section #
;#############################
```

```
;Main editor - to input & edit a line
; Similar to Spectrum at 0F2C
```

```
0A82 2A3D5C  LD HL,(ERR_SP) ;Address of error handler
0A85 E5      PUSH HL        ;Make it a return address
0A86 21E30B  LD HL,#0BE3    ;Address of edit error handler
0A89 E5      PUSH HL        ;Make it a return address
0A8A ED733D5C LD (ERR_SP),SP ;Error handler is now edit error hand
```

```
                ;Get each keystroke
                ; Similar to Spectrum at 0F38

0A8E CDCF11     CALL #11CF    ;Wait for a keypress
0A91 F5         PUSH AF       ;Save it
0A92 1600       LD   D,#00
0A94 FD5EFF     LD   E,(IY-1) ;PIP - length of key click
0A97 21C800     LD   HL,#00C8 ;pitch
0A9A CDF303     CALL #03F3    ;BEEP the keypress
0A9D F1         POP  AF       ;Get the keypress
0A9E 218E0A     LD   HL,#0A8E
0AA1 E5         PUSH HL       ;A RET will effectively JP #0A8E

                ;*** The following 6 instructions are an addition for DELETE

0AA2 FE0C       CP   #0C      ;DELETE character
0AA4 200C       JR   NZ,L0AB2 ;If not DELETE

                ;Here for DELETE
0AA6 FDCB306E   BIT  5,(IY+48) ;FLAGS2 - DELETE key repeat
0AAA 2006       JR   NZ,L0AB2  ;If not repeat

0AAC FDCB015E   BIT  3,(IY+1)  ;FLAGS - L mode
0AB0 2835       JR   Z,L0AE7   ;If not, add a DELETE character

0AB2 FE18 L0AB2 CP   #18
0AB4 3031       JR   NC,L0AE7  ;If a printable character, or a token

0AB6 FE07       CP   #07
0AB8 3820       JR   C,L0AE7   ;Accept a PRINT comma

0ABA FE10       CP   #10
0ABC 383A       JR   C,L0AF8   ;Different routine to handle EDIT chars

                ;Control characters need more than one byte
0ABE 010200     LD   BC,#0002
0AC1 57         LD   D,A
0AC2 FE16       CP   #16       ;OVER control + 1
0AC4 390C       JR   C,L0AD2   ;If character was from INK to OVER

                ;Here for AT & TAB
0AC6 03         INC  BC
0AC7 FDCB377E   BIT  7,(IY+55) ;FLAGX
0ACB CA840B     JP   Z,#0B84   ;If doing INPUT ... LINE ...

0ACE CDCF11     CALL #11CF     ;Wait for keypress
0AD1 5F         LD   E,A       ;Save it

                ;Get extra bytes for control characters
0AD2 CDCF11 LOAD2 CALL #11CF   ;Wait for next character
0AD5 D5         PUSH DE        ;Save character
0AD6 2A5B5C     LD   HL,(K_CUR)
0AD9 FDCB0786   RES  0,(IY+7)  ;MODE - K mode
0ADD CDBB12     CALL #12BB     ;Make spaces
0AE0 C1         POP  BC        ;Get characters
0AE1 23         INC  HL
0AE2 70         LD   (HL),B
0AE3 23         INC  HL
0AE4 71         LD   (HL),C    ;Insert these in BC
0AE5 180A       JR   LOAF1     ;To insert character in A

                ;Add a character to INPUT or EDIT line
                ; Identical to Spectrum at 0F81

0AE7 FDCB0786 L0AE7 RES 0,(IY+7) ;MODE - K mode
0AEB 2A5B5C     LD   HL,(K_CUR) ;Cursor position
0AEE CDBB12     CALL #12BB      ;Make 1 space
0AF1 12 L0AF1   LD   (DE),A     ;Enter character in A into space
0AF2 13         INC  DE
0AF3 ED535B5C   LD   (K_CUR),DE ;Update cursor position
0AF7 C9         RET            ;RETurn thru #0A8E that was PUSHed

                ;Jump here from main editor. Handle editing keys
                ; Identical to Spectrum at 0F92

0AF8 5F LOAFB   LD   E,A
0AF9 1600       LD   D,#00     ;Put the code in DE
0AFB 21FF0A     LD   HL,#0AFF  ;Base address for EDIT routines
0AFE 19         ADD  HL,DE     ;Partial address
0AFF 5E         LD   E,(HL)    ;Get the offset
0B00 19         ADD  HL,DE     ;Address of handling routine

0B01 E5         PUSH HL        ;RET will execute it
0B02 2A5B5C     LD   HL,(K_CUR) ;Cursor position
0B05 C9         RET            ;Effective JP to handler routine

                ;Offset table for editing keys
                ; Identical to Spectrum at 0FF0

0B06 09         DEFB #09       ;EDIT
0B07 66         DEFB #66       ;cursor left
0B08 6A         DEFB #6A       ;cursor right
0B09 50         DEFB #50       ;cursor down
0B0A B5         DEFB #B5       ;cursor up
0B0B 70         DEFB #70       ;DELETE
0B0C 7E         DEFB #7E       ;ENTER
0B0D CF         DEFB #CF       ;Symbol Shift
0B0E D4         DEFB #D4       ;Graphics

                ;Handle the edit keys. Either pull down the current BASIC line
                ; or erase the present INPUT info
                ; Identical to Spectrum at 0FA9

0B0F 2A495C     LD   HL,(E_PPC) ;Current line #
0B12 FDCB376E   BIT  5,(IY+55)  ;FLAGX - INPUT mode
0B16 C2FD0B     JP   NZ,#0BFD   ;If so, clear the edit area
0B19 CDD616     CALL #16D6      ;Get address of current line
0B1C CD2413     CALL #1324      ;Get the line number
0B1F 7A         LD   A,D
0B20 B3         OR   E
0B21 CAFD0B     JP   Z,#0BFD    ;If number is zero, clear edit area
0B24 E5         PUSH HL         ;Save line address
0B25 23         INC  HL         ;Point to length
0B26 4E         LD   C,(HL)
0B27 23         INC  HL
0B28 46         LD   B,(HL)     ;Get the length
0B29 210A00     LD   HL,#000A
0B2C 09         ADD  HL,BC      ;Make it a little larger
0B2D 44         LD   B,H
0B2E 4D         LD   C,L        ;Put it in BC
0B2F CDBB1F     CALL #1FBB      ;See if there's enough room in memor
                                ; return here only if yes
0B32 CDFD0B     CALL #0BFD      ;Clear edit area
0B35 2A515C     LD   HL,(CURCHL) ;Current channel address
0B38 E3         EX   (SP),HL    ;Exchange it on the stack for curren
                                ; line address
0B39 E5         PUSH HL         ;Then stack that
0B3A 3EFF       LD   A,#FF      ;Channel "R" - internal stream
0B3C CD3012     CALL #1230      ;Make it current channel
0B3F E1         POP  HL         ;Line address
0B40 2B         DEC  HL         ;One less than that
0B41 FD350F     DEC  (IY+15)    ;E_PPC - prevent print of cursor
0B44 CDAC15     CALL #15AC      ;Print the BASIC line
0B47 FD340F     INC  (IY+15)    ;E_PPC - lo byte
0B4A 2A595C     LD   HL,(E_LINE) ;Address of line in edit area
0B4D 23         INC  HL
0B4E 23         INC  HL
0B4F 23         INC  HL
0B50 23         INC  HL         ;Point to BASIC part
0B51 225B5C     LD   (K_CUR),HL
0B54 E1         POP  HL         ;Original channel address
0B55 CD4812     CALL #1248      ;Set proper channel flags
0B58 C9         RET             ;Effective JP to #0A8E

                ;Handle a "cursor down"
                ; Identical to Spectrum at 0FF3

0B59 FDCB376E   BIT  5,(IY+55)  ;FLAG_I
0B5D 2008       JR   NZ,L0B67   ;If in INPUT mode
0B5F 21495C     LD   HL,E_PPC
0B62 CD5B16     CALL #165B      ;Get next line number
0B65 186D       JR   L0BD4      ;Do an automatic listing

0B67 FD360010 L0B67 LD (IY+0),#10 ;ERR_NR - code for STOP in INPUT
0B6B 181D       JR   L0B8A      ;Treat it as an error

                ;Handle a "cursor left"
                ; Identical to Spectrum at 1007

0B6D CD970B     CALL #0B97      ;Decrement cursor, unless at start
0B70 1805       JR   L0B77      ;Redo K_CUR
```

CHARACTER SETS
by Scott Eddy, SINCUS

This is a guide for making your own character sets for the TS 2068.

First, you need to design the characters for your sets. These directions provide space for five sets in RAM, starting at 60928. Each character consists of 8 lines. Add 128, 64, 32,16,8,4,2,and 1 for pixels respectively as you go left to right. As an example, the character A is represented by DATA 0,60,66,66,126,66,66,0. You also have to decide where to locate your characters on the keyboard.

Next, you need a data list loader program to generate the characters.   The first section of Lines 210 through 250 in the following program and my values for the variable C in those lines should only be treated as examples, as you might not want to locate your characters where I put mine. Note also that the characters in the ROM will all be copied into RAM and the ones you don't pave over with your own characters will remain as is.

```
10    REM (name)
40    CLEAR 60927
50    FOR N = 1 TO 5
60    LET S = 44544 + 768 * N
100   FOR C = 32 TO 127
110   LET V = 15360 + 8 * C
120   FOR L = 1 TO 8
130   LET A = V + S
140   POKE A, PEEK V
200   REM Change Chrs
210   IF N = 1 AND ( C=33 OR ( C > 34 AND C < 42) OR ( C > 46 AND C < 59 ) OR ( C >
62 AND C < 91 ) OR ( C > 94 AND C < 123 ) ) THEN READ D: POKE A, D
220   IF N = 2 AND ( C = 33 OR C = 35 OR C = 38 OR C = 39 OR C = 64 OR ( C > 94 AND
C < 123 ) ) THEN READ D: POKE A, D
230   IF N = 3 AND ( ( C > 64 AND C < 72) OR ( C > 72 AND C < 81 ) OR ( C > 81 AND C
< 91 ) OR ( C > 96 AND C < 113 ) OR ( C > 113 AND C < 123 ) ) THEN READ D: POKE A,
D
240   IF N = 4 AND ( C = 35 OR C = 38 OR C = 39 OR C = 44 OR C = 46 OR C = 59 OR C =
63 OR ( C > 95 AND C < 123 ) ) THEN READ D: POKE A, D
250   IF N = 5 AND ( ( C > 64 AND C < 91) OR ( C > 96 AND C < 123 ) ) THEN READ D:
POKE A, D
300   REM (name)
```

Use the 300's, 400's, 500's, 600's, and 700's for your five data lists.

```
900   LET V = V + 1
910   NEXT L
920   NEXT C
930   NEXT N
1000 REM End
```

Now run this loader program. If you have 5 sets, it will take 25 minutes. Then save the data in a couple of places.
```
      SAVE "AlphaDL"CODE 60928,3840
```

We are now ready to write a program that will produce character sets.
The strings in Lines 30 through 70 should only be considered to be examples, as are the names of alphabets and their initials used for variables.

```
10    REM Alphabets
20    CLEAR 60927
30    LET J$ = "ABGDWZE%'JILX!KH:&?MYN#)@P(%SVTRCU_Q OFvbgdwze 47j
ilx1kh'6/myn392p85svtrcuOqof"
40    LET K$ = "abvgde#_zijklmnoprstufhqcwx!y@''&"
```

```
10   REM Alphabets                          260  PRINT
20   CLEAR 60927                            265  PRINT
30   LET J$ = "ABGDWZE$'JILX!KH:&?M         270  PRINT TAB 4;"To change it,press RUN."
YN#)@P(%SVTRCU_Q OFvbgdwze 47j ilx1         280  PAUSE 0
kh'6/myn392p85svtrcu0qof"                   290  IF INKEY$ = "" THEN GO TO 290
40   LET K$ = "abvgde#_zijklmnoprst         300  IF NOT ( INKEY$ = "A" OR
ufhqcwx!y@''&"                              INKEY$ = "C" OR INKEY$ = "G"
50   LET L$ = "ABGDEZWYIKLMNXOPRSTU         OR INKEY$ = "H" OR INKEY$ =
FCVJ h   abdgezwyiklmnxoprst ufcvj"         "L" OR INKEY$ = "S" ) THEN GO TO 1000
60   LET M$ = "s#rq'w,fpec;njmiok?i         310  IF INKEY$ = "A" THEN GO TO 400
tyzuxvhdg'ba            .&"                  320  IF INKEY$ = "C" THEN GO TO 500
70   LET N$ = "ABCDEFGHIJKLMNOPQRST         330  IF INKEY$ = "G" THEN GO TO 600
UVWXYZ"  abcdefghijklmnopqrstuvwxyz"        340  IF INKEY$ = "H" THEN GO TO 700
80   LOAD "AlphaDL"CODE 60928,3840          350  IF INKEY$ = "L" THEN GO TO 900
90   CLS                                    360  IF INKEY$ = "S" THEN GO TO 800
100  REM Printout                           400  REM Armenian
105  POKE 23606, 0                          410  POKE 23606,0
110  LET y = 23607                          420  POKE 23607,237
115  PRINT                                  430  CLS
120  POKE y, 237: PRINT J$                  440  PRINT AT 9,0;J$
125  PRINT                                  450  GO TO 1000
130  POKE y, 240: PRINT K$                  500  REM Cyrillic
135  PRINT                                  510  POKE 23606,0
140  POKE y, 243: PRINT L$                  520  POKE 23607,240
145  PRINT                                  530  CLS
150  POKE y, 246: PRINT M$                  540  PRINT AT 9,0;K$
155  PRINT                                  550  GO TO 1000
160  POKE y, 60: PRINT N$                   600  REM Greek
165  PRINT                                  610  POKE 23606,0
170  POKE y, 249: PRINT N$                  620  POKE 23507,243
180  PAUSE 300                              630  CLS
200  REM Choice                             640  PRINT AT 9,0;L$
205  POKE 23607, 60                         650  GO TO 1000
210  CLS                                    700  REM Hebrew
220  PRINT AT 8,4;"What alphabet would you" 710  POKE 23606,0
221  PRINT TAB 6;"like to use?  Press"      720  POKE 23607,246
225  PRINT                                  730  CLS
230  PRINT TAB 9;"A for Armenian"           740  PRINT AT 9,0;M$
235  PRINT TAB 9;"C for Cyrillic"           750  GO TO 1000
240  PRINT TAB 9;"G for Greek"              800  REM Script
245  PRINT TAB 9;"H for Hebrew"             810  POKE 23606,0
250  PRINT TAB 9;"L for Latin"              820  POKE 23507,249
255  PRINT TAB 9;"S for Script"             830  CLS
                         840  PRINT AT 9,0;N$
                         850  GO TO 1000
                         900  REM Latin
                         910  POKE 23606,0
                         920  POKE 23606,60
                         930  CLS
                         940  PRINT AT 9,0;N$
                         1000 REM End
```

    If you want a program with just one character   set   and   no   menu, make th
following changes:-

Line 40 CLEAR 63999
Delete the FOR and NEXT lines concerning the variable N.
Line 60 LET S = 48384
Skip references to the variable N, such as IF N = 1 AND in the one line you will ne

12

REVISED REVIEW: SPECTERM-64 Ver.4.0 & 4.1   by Pete Fischer

This program first appeared as a commercial program in England where it is widely used on the Spectrum. Grey & Clifford Computer Products obtained the rights to sell it in the U.S. as modified for the 2068. Version 4.0 ran only in Spectrum mode. There are both Spectrum & 2068 versions of 4.1.

! NOTE: I originally reviewed this software in Ver.1.0 of "The T/S Guide to Tele- !
! communications". Much of that review proved erroneous. Please read this carefully!
!   !

The big news here is Telecommunications at 1200 B.P.S. on the 2068. This is the ONLY way to achieve that speed on this computer. How can I describe 1200 B.P.S.? Well, let me put it this way, if you bought a magazine and could only look at 10 sq. inches at a time and had to read the ENTIRE MAGAZINE in sequence- that's 300 bps. But 1200 is like skipping through till you find the part you want and THEN stopping to read. It's much more satisfying and efficient.

It also puts Long Distance telecommunications in a "whole other dimension". As I mentioned elsewhere, an Xmodem transfer at 1200 BPS takes ONE EIGHTH the time of HEX transfer at 300 BPS; with the additional benefit of error checking. Once you begin serious downloading, you will truely appreciate this!

. The second big feature of this software is it's versatility which is m-nifest in a block of 7K designated as a permanent BASIC component. That is, permanent all the time you're online, it dosen't get erased the way the MTERM II buffer does. However, you can easily change it, just by loading a different version. What good is that major block of memory? Well one PRIMARY use is to interface the program to YOUR mass storage, WHATEVER that may be: Microdrive, Disk Drive or Ramdisk (coming soon).

The next major use is to interface a WIDE range of modems which is particularly easy with the use of the Z-SI/O Card, but also possible through other RS-232 interfaces.

What else? Well there have been a wide variety of utilities written for MTERM over the years, all squeezed into small blocks of memory left over by accident. The 7K block in the Specterm software is a LARGE BLOCK by comparison. In it, you could easily put printer drivers, RLE decoders, auto-save routines or a number of other utilities ALL AT THE SAME TIME!

Those routines used to I/F the mass storage and modems are called "OVERLAYS", and were developed by CP/M programmers to allow easy modification of a program without divulging the SOURCE CODE. When you buy Specterm 64, what you're buying is the CODE. But packaged with it, as a convenience , are some examples of these OVERLAYS.

In my first review, I said, quite negatively, that you need to enter a long BASIC statement in order to check the buffer. That was ABSOLUTELY FALSE! You can simply incorporate this statement into the BASIC component, and thus, easily check the buffer, simply by escaping to BASIC. In fact, this routine is provided in the stock tape as it comes from Grey & Clifford. I had simply failed to load that Overlay.

This terminal generates 64 columns WITHOUT the use of the OS-64 cartridge. This in itself turns out to be a big feature.. Nearly all BBS' are configured for 80 col., and while it isn't perfect, 64 col is MUCH CLOSER. A monitor is pretty essential, one I bought for $30 worked perfectly. The character set has been designed for readability (better than Tasword, I think). Once you get used to 64 Col, it's difficult to go back to 32 col for terminal work. It DRAMATICALLY increases the amount of infor mation on the screen at any one time. All too often, at 32 Col., by the time you get to the bottom of a menu, the top has scrolled off the screen. This NEVER happens in 64 col. In addition, the ARRANGEMENT of the menu makes more sense, and is easier to follow.

In my original review, I decried the lack of an 80 col printing facility. Beside the potential to add one through the 7K BASIC area (as Tony Gomez has recently done), the standard buffer saves are completely Tasword2 compatible. Although they may be

too long, it's easy to break them up with Unloader, then simply load them into Tasword and print from there.

Also, in my original review, I stated that , upon downloading it was impossible to tell if the transfer was successful or not. THAT WAS ALSO INCORRECT. The blinking "R" on the screen tells you it's a successful transfer.

Another mistake I made in my first review was when I said, "If you forget the CAPS LOCK and enter a lower case letter in command mode... you must then reboot the program." Not true at all! (Are you beginning to see how BADLY I mangled the first review?) If you make the above error, it will simply refuse the command until you use a capitol letter. It WILL lock-up and need rebooting if you go offline (using the 2050 modem) and fail to immediately escape to BASIC. However, once you understand this, there's no problem.

Since my original review, I've put this program through a great deal of testing-spending hours and hours online & making file transfers (over 100) of all descritions. I moved MAC files, AMIGA files, IBM files Text files and Etc.It worked beautifully. There WERE failures, but none I couldn't eventually trace to operator error or Host error. The trick to moving files on foreign computers is this: don't save/load it. Call board A, D/L, disconnect, call board B, and U/L. As I said, I did this MANY times with great success.

One feature I grew to like more and more was the speed of the keyboard. The keyboard scan routine on MTERM is a very slow one. Put mildly, it's a pain. I can, and frequently do, out-type it. But the joy of Specterm is that you can type MUCH faster. This is great on L.D. calls. Specterm also gives you "audio feedback" for each keypress. I really missed it when I went back to other terms. My experience showed that ver 4.0 was a bit TOO fast, but both versions of 4.1 are adjustable so you can select the speed you want. Both new versions also allow for color control of the screen.

One of the BEST things about this program is the certainty of future support. You will be hard pressed to find two people who are more knowledgeable and have done more for T/S Telecommunications than Ed Grey and Dave Clifford. Their support is available both by voice and by modem- the latter in the form of the TIMEXCHANGE BBS. They and fellow users are currently working on utilities to enhance the program and are available for download free from the TIMEXCHANGE.

So, The big reasons for going to Specterm 64 are these:
1) 1200 BPS Communications, the ONLY way to do this on the 2068
2) Tremendous versatility in the form of a wide-open 7K BASIC component thus enabling direct access to YOUR mass storage device and/or a wide variety of modems.
3) VERY active continued support for the system with new utilities & additions all the time- available on the TIMEXCHANGE BBS.
4) The size of the buffer :31.487K
5) Better display and no need for the OS-64 Cartridge.
6) A Faster keyboard (the newest versions let you adjust the speed)
7) Allows you to use nearly ANY RS-232 modem (the industry standard) when used with a Z-SI/O Card.

I HATE to see a good product maligned by poor reviewing and hope you will under stand my error in rushing v 1.0 to print.

The main differences between ver 4.0 and the 2 v.4.1 (Spectrum & 2068) are these: A)4.0 is Spectrum only B)4.1 allows you to adjust the keyboard speed and screen color (not true of 4.0) C) The new versions have "RELAXED" Xmodem which allows them to work through PC Pursuit. If you own ver4.0 and want to upgrade to the SPECTRUM v.4.1, it will cost you $5 even. If you want the 2068 v.4.1 it will cost $30+ $2 S&H. The Program is available from RMG, SUNSET, Variety Sales, or Grey and Clifford Computer Products/ POBox 2186/Inglewood,CA 90305 (213)759-7406

I had received a letter from a T/S friend the day after I received my computer and he stated that he had ordered one. And when I blew mine I called him up to warn him but he already had his up and running. He had ordered his with the 16K rampak and it all worked. The rampak looks like the Timex 1016 except it is white. His computer came with a 110 VAC power supply.

He tried to load in some programs and he found that all basic programs loaded all right but machine code puts the computer in a cycle printing out the last few lines of the program clearing the screen and repeating. and RESET would not stop or clear the program out of the computer, he had to pull the plug to get control again.

By Donald Lambert, 3310 Clover Dr., Cedar Rapids, IA 52404
Part II next issue.

for locating your characters on the key board.
RUN this loader program--it will take about 5 minutes.
        SAVE "AlphaDL" CODE 64000, 768
Then write a program with lines as follows:-
        CLEAR 63999
        LOAD "AlphaDL" CODE 64000, 768
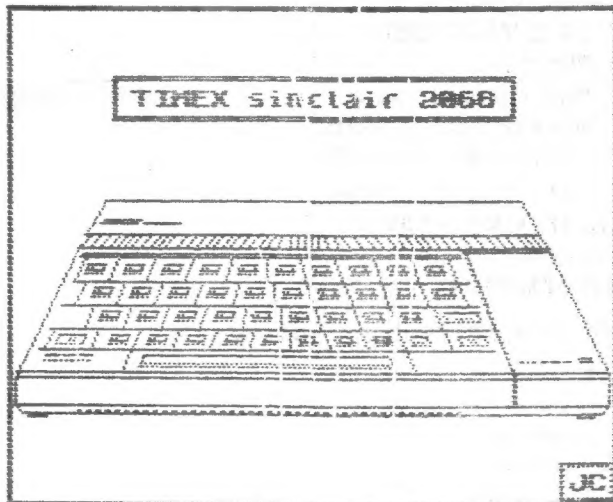   CLS
        POKE 23606, 0
        POKE 23607, 249
        PRINT "(your alphabet)"
        PAUSE 300

Here is a short POKE listing that will save a great deal of trouble when you want a listing of whats on those 90 minute tape Instead of using COPY when you get 21 lines of screen data
POKE 26692,80:POKE 26697,80
LOAD
any name
Then run your recorder
These Poke listings were in the Nov/Dec issue of TIME DESIGNS
By P.Aylesworth,Ontario,Canada
I tried this out as a way to get a tape listing,and it works
this only works in the 2068 mode
Carl Morris

Here is sample
  10 POKE 26692,80
  15 POKE 26697,80
  20 LOAD "Listings"

Program: Xmas Card
Bytes: XMAS
Program: Message
Program: Titlemaker
Program: REGRESSION
Program: BAR GRAPH
Program: SCROLLS
Program: AUTUMN
Program: No. SORT
Program: WORD SORT

```
**********************************************
*      Sinclair Computer Users Society      *
*                est. 1982                  *
*------------------------------------------*
*   1986----SINCUS OFFICERS----1987         *
* PRESIDENT.....................JOHN SIMS   *
* VICE PRESIDENT..............GARY ENNIS    *
* TREASURER.................GEORGE PENNEY   *
* SECRETARY...................PAUL HILL     *
* TRUSTEE................WES BRZOZOWSKI      *
* TRUSTEE.............DAVE SCHOENWETTER      *
* TRUSTEE.......................DON LAMEN    *
* BOOK LIBRARY.............CHARLES KOETH     *
* TAPE LIBRARY.......DON LAMEN, HAL SOHN     *
* EDITOR.......................PAUL HILL     *
**********************************************
```

                        SNOW
            <<<<<<<EMERGENCY>>>>>>>
                       NOTICE
If a SNOW EMERGENCY TRAVEL ADVISORY is issued by the BROOME COUNTY SHERIFF
-on the DAY of our MONTHLY meet, the MEETING is CANCELLED & We WILL meet at
the next SCHEDULED MEETING--DONT TAKE CHANCES, We'd rather see you next
time. call 798-7219 after 5pm to check on cancellation. DRIVE WITH CARE
...DUE to Snow fall, frost, and other dismal weather conditions that can
and have occured in past Mays and some Junes, this public service message
is brought to you in the hopes that spring really will come and those short
sleeve shirts you dug out in early April will once again be useful...

Elections at the May Meet: Use the mail ballot for nominations or voting if
you can not be there. Mail it before May 11, 1987.
```
President..........John Sims............... _____
V Pres. ...........Dave Schoenwetter...... _____
Treasurer..........George Penny........... _____
Secretary..........Paul Hill.............. _____
Trustee............Wes Brzozowski......... _____
                   Don Lamen.............. _____
                   William Tilley......... _____
```

Did you know that it is against the US Federal laws to publish in the USA
anything that is broadcast on Voice of America? Yup since 1947.